

**ABSTRACT****Optical Sub-Carrier Multiplexed Transmission**

5 Apparatus for generating and receiving optical sub-carrier multiplexed signals has a digital signal processor for performing a Fourier transform, to generate or receive the optical sub-carrier multiplexed signal. This apparatus enables the generation and reception of the optical sub-carrier multiplexed signal in a single apparatus, giving cost and complexity savings over conventional methods of receiving each sub-carrier in an independent apparatus. Due to the use of Fourier transforms the sub-carrier spacing  
10 can be reduced to  $1/(\text{Symbol period})$  giving improvements in the spectral efficiency of the system